1. Evaluate the following integrals using the method of substitution.
   (a) $\int \frac{1}{\ln(x^x)} dx$.
   (b) $\int \frac{e^{2x}}{\sqrt{3-4e^{2x}}} dx$.
   (c) $\int \frac{1}{\sqrt{4-(x+3)^2}} dx$.

2. Suppose that $y = f(x)$ and $y = g(x)$ are both continuous functions on the interval $[a, b]$. Determine if each statement below is always true or sometimes false.
   (a) Suppose that $f(c) > g(c)$ for some number $c \in (a, b)$. Then the area bounded by f, g, $x = a$, and $x = b$ can be found by evaluating the integral $\int_a^b (f(x) - g(x))dx$.
   (b) If $\int_a^b (f(x) - g(x))dx$, evaluates to -5, then the area bounded by $f, g, x = a$, and $x = b$ is 5.
   (c) If $f(x) > g(x)$ for every $x \in [a, b]$, then $\int_a^b |f(x) - g(x)|dx = \int_a^b (f(x) - g(x))dx$

3. Find the area bounded by the region between the curves $f(x) = x^3 + 2x^2$ and $g(x) = x^2 + 2x$.

4. Find the area bounded by the region enclosed by the three curves $y = x^3$, $y = -x$, and $y = -1$.

5. Find the area bounded by the curves $y = \cos(x)$ and $y = \sin(2x)$ on the interval $[0, \frac{\pi}{2}]$.

6. Find the area of the triangle with vertices at the points $(0, 1)$, $(3, 4)$, and $(4, 2)$. USE CALCULUS.

7. For each function below: (i) determine which method to use to evaluate the function (formula, u-substitution, or integration by parts, and (ii) evaluate the integral.
   (a) $\int \frac{\sqrt{\ln(x)}}{x}$.
   (b) $\int (\ln(x))^2$.